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EXAMINER

HUFFMAN, JULIAN D

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 14 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The drawings depict a bent PCB, but it cannot be determined from the drawings how the PCB is bent or to what angle or degree it is bent. Applicant has used an approximate drawing which is not to scale to provide support for specific dimensions. Further the specification fails to describe the angle to which the PCB is bent. The language of claim 14 therefore constitutes new matter.

Claim 14 is rejected under 35 U.S.C. 112, first paragraph, because the specification does not reasonably provide enablement for bending the PCB specifically at an angle in excess of 45 degrees. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

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The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The disclosure fails to provide support for the claim language of claim 14 and claims must be interpreted in light of the specification, therefore claim 14 is indefinite.

Angles must be measured relative to a frame of reference and claim 14 does not specify a frame of reference from which the PCB is bent 45 degrees.

Claim 14 could not be examined since its scope is unclear.

### ***Specification***

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter found in claim 14. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-10 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al. (U.S. 6,467,870 B2) in view of Oda (JP 3-147900) and Sharma (6,276,782 B1).

Matsumoto et al. discloses :

With regards to claim 4, a print assembly for pagewidth inkjet printing, the print assembly comprising:

an elongate carrier that is mountable on a support structure of a printer in an operative position with respect to a platen of the printer (fig. 1, element 10);

a number of printhead chips (22), the printhead chips positioned on the carrier and together defining a printhead that is configured to eject drops into a printing zone defined between the printhead and the platen of the printer, the printhead chips being positioned at a common angle of greater than zero degrees and less than ninety degrees with respect to a line extending a length of the printing zone, so that consecutive printhead chips overlap at their ends (a diagonal line which is offset from the printhead modules by an angle of between 1 and 45 degrees still extends the length of the printing zone, and provides for chips positioned at an angle of greater than zero degrees and less than ninety degrees with respect to this line);

control circuitry that is also positioned on the carrier and that is configured to control operation of the printhead chips (fig. 2, element 38, column 7, lines 28-31 and 41-45); and

a feed mechanism positioned on the support structure for feeding a print medium through the printing zone (column 7, lines 46-51).

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With regards to claim 10, this limitation does not further limit the structure of the claimed device.

With regards to claim 16, an inkjet printer that comprises

a support structure;

a platen positioned in the support structure (column 1, lines 12-22);

a print assembly positioned operatively with respect to the platen, the print assembly comprising an elongate carrier (14);

a number of printhead chips (22) positioned on the carrier, the printhead chips together defining a printhead that is configured to eject drops into a printing zone defined between the printhead and the platen, the printhead chips being each positioned at a common angle of greater than zero degrees and less than ninety degrees with respect to a line extending a length of the printing zone, so that consecutive printhead chips overlap at their ends (see discussion of claim 4 above); and

control circuitry that is also positioned on the carrier and that is configured to control operation of the printhead chips (fig. 2, element 38, column 7, lines 28-31 and 41-45); and

a feed mechanism positioned on the support structure for feeding a print medium through the printing zone (column 7, lines 46-51).

Matsumoto et al. disclose that the number of head chips is not limited (column 6, lines 23-26).

Matsumoto et al. disclose CMOS driver circuitry on each printhead chip which functions as control circuitry for ejecting all of the nozzles to achieve page width printing (fig. 2, element 38, column 7, lines 28-31 and 41-45).

Matsumoto et al. does not disclose ejecting drops at a rate of at least twenty billion drops per second, or the printhead chips together incorporating at least two hundred thousand nozzle arrangements, or between forty and one hundred printhead chips positioned on the carrier.

Matsumoto et al. does not disclose a feed mechanism positioned on the support structure for feeding a print medium through the printing zone, the feed mechanism including a media roll for carrying print media to be provided to the printing zone and a take up spool configured to receive printed print media from the printing zone, wherein the feed mechanism is positioned on the support structure so that the take up spool is located beneath the media roll, wherein the feed mechanism is positioned on the support structure so that the media roll is located between the take up spool and the carrier.

Matsumoto et al. does not disclose a media tray configured to store the media roll positioned between a pair of legs of the support structure.

Matsumoto et al. does not disclose a MEMS system with actuator arms to eject ink.

Oda discloses a feed mechanism positioned on a support structure with legs for feeding a print medium through a printing zone (figs. 2 and 5), the feed mechanism including a media roll (20) for carrying print media to be provided to the printing zone

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and a take up spool (22) configured to receive printed print media from the printing zone, wherein the feed mechanism is positioned on the support structure so that the take up spool is located beneath the media roll (fig. 4, the take up spool 22 is located under the media roll 20), wherein the feed mechanism is positioned on the support structure so that the media roll is located between the take up spool and the carrier (fig. 2, the media roll is between the support structure near the top of legs 4 and 6 and the take up spool).

Sharma discloses a MEMS system with actuator arms to eject ink (fig. 2).

The examiner takes official notice that it is well known in the art to provide paper storage in printing devices between the supporting legs, for example, doors near the base of copiers that open to reveal compartments that store print media and the like.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide, in the invention of Matsumoto et al., a larger number of nozzle arrangements, such that at least twenty billion drops per second may be ejected. The reason for performing the modification would have been to select the number of nozzle arrangements and print head chips to provide the desired size, number of pixels and resolution (column 6, lines 23-26).

It would have been obvious to one having ordinary skill in the art at the time of the invention to provide the media feed mechanism and support structure of Oda to support the print head structure of Matsumoto et al. for the purpose of enabling feed of a roll paper while preventing the paper from being caught in a roller (abstract) and to



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further provide a media tray for storage between the legs of the support structure so as to provide a way to store media conveniently in the printer housing.

It would have been obvious to one having ordinary skill in the art at the time of the invention to replace the thermal actuators of Matsumoto et al. with the MEMS thermal bend actuator arm of Sharma for the purpose of enabling the device to eject high viscosity inks.

Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al. in view of Oda and Sharma as applied above and further in view of Fabbri (U.S. 6,068,367).

Matsumoto et al. disclose CMOS driver circuitry on each printhead chip which functions as control circuitry (fig. 2, element 38, column 7, lines 28-31 and 41-45).

Matsumoto et al. further discloses a micro electromechanical system since the device converts electrical energy into mechanical energy to propel and ink droplet, and the device structure is on the micro scale.

Matsumoto et al. as modified by Oda do not expressly disclose control circuitry and CMOS driver circuitry provide on each printhead chip.

Fabbri discloses providing extensive control circuitry in addition to driver circuitry on each printhead chip in a page width printer (column 5, lines 36-61).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to, in the invention of Matsumoto et al., further provide control circuitry on each printhead chip. The reason for performing the modification would have

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been to, as taught by Fabbri, simplify the structure of the lines used to connect the printhead chips (column 5, lines 55-57).

### ***Response to Arguments***

Applicant's arguments filed have been fully considered but they are not persuasive.

Applicant states that "by including the new citation Sharma to arrive at the present invention, the examiner is plainly using hindsight which is of course impermissible".

Clearly the rejection is not the product of hindsight, however, the examiner cannot provide any further response to this argument without further explanation by applicant.

Applicant states that "Applicant proposes amending claims 4 and 16 to include the features of claim 15".

However, the amendment does not include the limitations found in claim 15 by way of its dependency from claims 14, 13, 12, 11 and 10.

Applicant argues that providing paper storage between supporting legs of printing devices is not well known, despite that fact that practically all photo copiers include paper storage between the supporting legs. Further, providing such is obvious and not inventive.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian D. Huffman whose telephone number is (571) 272-2147. The examiner can normally be reached on 10:00a.m.-6:30p.m. Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Julian D. Huffman/  
Primary Examiner, Art Unit 2853